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Files

- sample_data
- telco_churn.csv

```
import pandas as pd
import numpy as np
df = pd.read_csv('telco_churn.csv')
print(df.head())
print(df.info())
print(df.describe())
print(df.isnull().sum())
df = df.dropna()
df = df.dropna(axis=1)
df = df.fillna(value=0)
df = df.fillna(method='ffill')
df = df.fillna(method='bfill')
df = df.drop_duplicates()
df['TotalCharges'] = df['TotalCharges'].apply(lambda x: pd.to_numeric(x, errors='coerce')).dropna()
Categorical_features = df.drop(['customerID', 'TotalCharges', 'MonthlyCharges', 'SeniorCitizen', 'tenure'], axis=1)
Categorical_features.head()
from sklearn import preprocessing
le = preprocessing.LabelEncoder()
df_Categorical = Categorical_features.apply(le.fit_transform)
df_Categorical.head()
```

12 DeviceProtection 4392 non-null object
13 TechSupport 4392 non-null object

2s completed at 8:15 PM

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Search

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Code

```
1s
0 Unnamed: 0 customerID gender SeniorCitizen Partner Dependents tenure \
0 0 7590-VHVEG Female False True False 1
1 1 5575-GNVDE Male False False False 34
2 2 3668-QPYBK Male False False False 2
3 3 7795-CFOCW Male False False False 45
4 4 9237-HQITU Female False False False 2

PhoneService MultipleLines InternetService ... DeviceProtection \
0 False NaN DSL ... False
1 True False DSL ... True
2 True False DSL ... False
3 False NaN DSL ... True
4 True False Fiber optic ... False

TechSupport StreamingTV StreamingMovies Contract PaperlessBilling \
0 False False False Month-to-month True
1 False False False One year False
2 False False False Month-to-month True
3 True False False One year False
4 False False False Month-to-month True

PaymentMethod MonthlyCharges TotalCharges Churn
0 Electronic check 29.850000 29.850000381469727 False
1 Mailed check 56.950001 1889.5 False
2 Mailed check 53.849998 108.1500015258789 True
3 Bank transfer (automatic) 42.299999 1840.75 False
4 Electronic check 70.699997 151.64999389648438 True
```

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12 DeviceProtection 4392 non-null object

13 TechSupport 4392 non-null object

14 StreamingTV 4392 non-null object

15 StreamingMovies 4392 non-null object

16 Contract 5043 non-null object

17 PaperlessBilling 5043 non-null object

18 PaymentMethod 5043 non-null object

19 MonthlyCharges 5043 non-null float64

20 TotalCharges 5038 non-null object

21 Churn 5042 non-null object

dtypes: float64(1), int64(2), object(19)

memory usage: 866.9+ KB

None

Unnamed: 0 tenure MonthlyCharges

count 5043.000000 5043.000000 5043.000000

mean 1305.651993 32.576641 65.090214

std 801.484415 24.529807 30.068133

min 0.000000 0.000000 18.400000

25% 630.000000 9.000000 35.775000

50% 1260.000000 29.000000 70.550003

75% 1890.500000 56.000000 90.050003

max 2999.000000 72.000000 118.650002

Unnamed: 0 0

customerID 0

gender 0

SeniorCitizen 0

Partner 0

Dependents 0

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gender 0

SeniorCitizen 0

Partner 0

Dependents 0

tenure 0

PhoneService 0

MultipleLines 269

InternetService 0

OnlineSecurity 651

OnlineBackup 651

DeviceProtection 651

TechSupport 651

StreamingTV 651

StreamingMovies 651

Contract 0

PaperlessBilling 0

PaymentMethod 0

MonthlyCharges 0

TotalCharges 5

Churn 1

dtype: int64

Unnamed: 0 gender Partner Dependents PhoneService MultipleLines InternetService OnlineSecurity OnlineBackup Dev

0 0 1 0 0 1 0 0 3 0

1 2 1 0 0 1 0 0 3 3

4 4 0 0 0 1 0 1 0 0

5 5 0 0 0 1 1 0 0

RAM

Disk

Gemini

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2s

2	2	1	0	0	1	0	0
4	4	0	0	0	1	0	1
5	5	0	0	0	1	3	1
6	6	1	0	2	1	3	1

Next steps: [Generate code with df_Categorical](#) [View recommended plots](#)

[] Start coding or [generate](#) with AI.

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